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ABSTRACT

This study was undertaken to determine whether the process of collecting observational data on mother-infant interactions influences the phenomena under investigation. A total of 40 white mother-infant dyads participated in the study. Half of the mothers were middle class and half were working class, and within each class group, half of the infants were male and half were female. All of the infants were between 10 and 11 months old at the time of the study. To assess the effect of the presence of an observer does have significant differential effects for the two on the mother-infant interaction while the experimenter was present in the playroom and also while the mother and infant were alone in the playroom unaware that they were being observed. All actual observation and recording of data was done from an adjacent observation room. Results indicated that in a laboratory investigation, the presence of an observer does have singificant differential effects for the two social classes, with the working class mothers producing significantly more verbalization in the unobtrusive condition and the middle class mothers verbalizing equally in both conditions. There was no significant main effects for sex of infant. (JMB)

An Analysis of Observer Influence on Sex and Social Class Differences in Mother--Infant Interaction

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An Analysis of Observer Influence on Sex and Social Class Differences in Mother--Infant Interaction

The title of this paper, an analysis of observer influence on sex and social class differences in mother--infant interaction, is that of my doctoral dissertation written largely while a student at the State University of New York at Buffalo. Today I would like to report on some of the more interesting results of that effort.

The central idea of this study was the concern that the process of collecting data using observations may have an influence on the very phenomena under investigation, much like the Heisenberg Uncertainty Principle of modern atomic physics.[1] The impetus for the idea behind the present study stemmed in part from a discussion with Dr. Michael Lewis following a colloquium in Buffalo. In the month following it became clear that clarification of this issue was critical, because it relates directly to the validity of any data so obtained.

When I began to explore this issue in depth, it became apparent that my speculation on this issue was by no means original. The question of the observer's influence on parent--child interaction had been raised as early as 1946 by Barbara Merrill Bishop and had been restated a number of times since then (e.g., Moss, 1965, Lewis, 1972). However, the issue had received little in the way of empirical investigation.

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[1]With the advent of the electron microscope, a problem arose when trying to observe subatomic particles, largely because the particles of the medium of observation (electron) were as large as the event being studied. It, thus, became impossible to know simultaneously the position and velocity of the particles.

Perhaps one reason that the question of the influence of observation has received so little attention, aside from the fact that it is awkward to assess this problem, is that the reaction of subjects to knowledge of observation might be considered to be relatively consistent across subjects. This would be analagous to using a thermometer with a constant error to measure the temperatures of various rooms. One could not know the actual readings, but one could tell which room was warmest and by how much. To cite a more relevant example, one might be inclined to assess differences in maternal and infant behaviors of a group of first-born infants compared to a group of latter-born infants. If awareness of observation were to have a relatively constant effect across subjects, then one may not know the absolute levels of behaviors, but would have a valid measure of the differences between groups.

A serious problem could arise, however, if the members of the groups being observed were in some way differentially sensitive to the awareness of observation. In such a case, one could obtain a false determination of the absolute frequency of behaviors for each group and a false picture of the differences between groups.

Within the past ten years, observational techniques have been used to study differences in mother--infant interaction between groups based on sex of infant (e.g., Goldberg and Lewis, 1969, Lewis, 1972) and social class of parents (e.g., Messer and Lewis, 1972, Tulkin, 1973). Among the many important facts uncovered by these studies were the following.

With regard to sex differences, mothers appeared to have made a cognitive committment to the gender identity of their infants, and showed displeasure when someone identified incorrectly the sex of their infants (Goldberg and Lewis, 1969). Perhaps the social nature of observational

research could increase a mother's perception of sex appropriate responses to her infant when observed relative to what would normally occur if she were not observed.

Concerning social class differences, Tulkin has observed that the frequency of maternal verbalizations was greater for middle class. He also noted that there were class differences in a mother's expectations of infant behavior. As with sex differences it is possible that these attitudinal differences could become most apparent when subjects were under observation.

The present research was undertaken with the intent of shedding some light on the question of the influence of an observer on a variety of mother--infant interaction behaviors. One of the central issues of this study was to discern which infant and maternal behaviors are most influenced by the presence of an observer. Although it was difficult to specify beforehand, it was hypothesized that for some behaviors, mothers would behave differently when in the prsence of an observer than when alone. Furthermore, since mothers were found to have made a cognitive commitment to the gender identity of their infants (Goldberg and Lewis 1969) and since maternal expectations of infant behavior were found to be different across social class (Tulkin 1970), it was felt that there would be a significant interaction of observation and sex and social class differences in mother--infant interaction. That is, sex or social class differences may be found when observed but not when the mothers are alone or vice versa.

Method

Subjects:

The sample consisted of 40 mother--infant dyads. All of the mothers were White; half of the mothers were middle class and half were working

class. Within each class group, there were 10 male and 10 female infants. Middle class was defined as follows: (a) the father had a skilled white collar job or professional position and (b) one parent had some college education. Working class homes were those in which the husband held an unskilled or skilled blue collar job or unskilled white collar job and neither parent had any college education. Using Hollingshead's (1958) classifications, six of the middle class group were from Class I, eleven were from Class II and three were from Class III. For the working class group, seventeen were from Class IV and three were from Class V. (See table 6 for a listing of father's occupations).

The infants were between 10 and 11 months old at the time of the study ($\bar{X}$ = 10.7 mo.). The mothers were paid volunteers recruited from Buffalo's suburban areas. Mothers' names were selected from the public record of births of the county from 10 to 11 months previously. Mothers were contacted by mail and invited to return a postcard which listed name, sex and age of infant and father's occupation. Mothers were then called, and an appointment was made for their visit to the laboratory. Roughly, one-sixth of the mothers that were contacted through the mailing responded favorably.[2]

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[2]Many of the mothers chose to call the author rather than send in the postcard, at which time demographic information was recorded and an appointment was made. Since names were selected from a public record of births, information such as age of parents and father's occupation were not available at the time of mailing. It therefore became impossible to know about the group of parents who did not respond. This unfortunately obscures a report of whether the obtained sample differed from the mailing population; e.g., whether middle class mothers responded in proportionately higher numbers than working class. It can be stated, however, that middle and working class parents responded in equal numbers, although it was noted that working class male infants were most difficult to obtain.

Design:

To assess the effect of the presence of an observer on the mother--infant interaction, two separate experimental periods were used, an obtrusive condition and an unobtrusive condition. In the obtrusive condition, the author was present in the playroom while the mother and infant were being observed. In the unobtrusive condition, the mother and infant were alone in the playroom unaware that they were being observed. All actual observation and recording of data was done from an adjacent observation room. The same mothers were seen in both the obtrusive and unobtrusive conditions.[3]

The order of presentation of conditions was counterbalanced, such that half of the mother--infant dyads in each sex-class group were observed first while alone in the room and secondly with the observer present. The remainder were observed first with the observer present and secondly with no observer present. Social class, sex of infant, and order of observation were between subjects factors in the design, while presence versus absence of observer was a within subjects factor.

Procedures:

After scheduling an appointment, subjects were assigned randomly to either order of observation. After greeting the mothers at the door, the

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[3]A question may arise concerning the professional ethics involved in observing subjects without their knowledge. All mothers knew they were to be observed and volunteered for participation. Since only simple observation was involved rather than harmful deception; e. g., creation of false anxiety, and since this important issue could be properly investigated no other way, it was felt that the infringements upon the privacy of the mothers would be excusable and that the investigations should be pursued. Since some of the mothers had friends who also were participating, and since all mothers had the right to be informed of the purposes of the investigation, the mothers were given delayed debriefing in a follow-up letter. In this letter, mothers were informed of the purpose, procedure and preliminary results of this investigation.

author escorted the mothers to the playroom. After a brief warm-up period during which snowsuits were removed and introductions made, the procedure was begun. The mother had been told in a general way the purpose of her visit in the initial letter of contact. The instructions to the mothers were as follows: "As I explained to you earlier, Mrs. X., we're interested in learning more about the lives of infants. I'm interested in observing how mothers and infants play together, or interact. I'd like you to do whatever feels natural—just as if you were at home." At this point, the author retired to his corner to make the "observations." In the obtrusive first order, the coders in the adjacent room began making the actual observations which lasted for twelve minutes. At the end of the twelve minute period, one of the coders came out of the observation room and knocked on the door of the playroom. Pretending to be the investigator's secretary, she informed him of a phone call, as follows:

"I'm sorry to interrupt, Mr. Randall, but you have an important phone call."

"Well, can't I call back? I'm in the middle of something."

"It is long distance, the call you were expecting."

"Mrs. X., could you please excuse me for a moment, while I attend to this? Please, just make yourself at home."

After an additional twelve minutes, during which the mother--infant interaction was again recorded with the author absent, the author returned, apologized for his absence and took his seat. The mother was then asked to fill out a questionnaire, which was the Ford Social Desirability Scale.

In the unobtrusive-first order, shortly after instructing the mother, there was a knock on the door, and the above conversation ensued. With the exception of changing the phrase, "just in the middle of," to "just

started," the conversation was identical. Mother--infant interaction was recorded for twelve minutes with the "observer" absent followed by twelve minutes with the "observer" present.

Since the room was constructed for unobtrusive observation and since it was crucial that the mothers be unaware of being observed during the author's absence, a brief interview was conducted to attempt to determine whether or not she had any suspicions. The interview consisted essentially of these questions: (1) Did you feel comfortable during the time you were here? (2) Do you feel that your baby felt comfortable during the observations? (3) Do you think your baby played much like he does at home? (4) Was there anything about the room or its furnishings that you might change to make people feel more at ease? The data of three mother--infant dyads were eliminated on the basis of responses to questions one and four.[4]

Setting and Materials:

All mother--infant dyads were seen in a specially designed playroom in the building of the psychology department. The room measured 13 x 16 feet. The room was equipped with a large (4 ft. x 6 ft.) one-way observation mirror, but since the actual purpose of such a mirror was thought to be obvious to any mother, it was disguised. Another abstract artwork panel was created for this purpose. Among the pattern of colored rectangles of this panel were two small "windows" made of transparent orange plastic. By observing through this "artwork," unobtrusive observation was gained and decoration for the room was provided.

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[4]These mothers had some contact with child observation, either through psychology courses or teaching experience. One of these mothers was currently doing a masters thesis using one-way vision mirrors.

The room was further decorated with a large colorful wall hanging and a gold carpet for the floor. Also in the room were several chairs. The "observer's" chair was placed in a corner near the observation windows and about ten feet away from the area where the mother and infant typically played. A chair facing the observation windows was provided for the mother along with several current "women's" magazines. Numerous toys were available for the infants to play with. The toys ranged in complexity of usage: from simple; e.g., blocks - to complex; e.g., Playskool Mailbox.

Observation Record:

A time sampling behavior checklist was devised with which to classify and tally the ongoing mother--infant interaction. (See Figures 1, 2, & 3 for a copy of the checklist and category explanation). The actual observation checklist was modeled after the behaviors examined by Tulkin and Kagan (1972). The checklist was divided into infant behaviors and mother behaviors. Behaviors to be studied were selected to three criteria. First, they had to be easily identifiable and quantifiable. Secondly, the effort was made to include a wide range of behaviors both physical and verbal. Thirdly, an effort was made to study those behaviors common to previous studies of mother--infant interaction (e.g., Goldberg and Lewis, 1969; Tulkin, 1973).

Observations were recorded with the aid of a timer which emitted a click and flashed a small light to signal the end of a ten-second interval. During the ten-second interval, coders checked off any and all maternal and infant behaviors which occurred during that interval and then proceeded to the next column of the checklist. Some behaviors could be tallied only once for each ten-second interval (e.g., mother ignores infant, mother merely observing infant).

Personnel:

In addition to the author, five undergraduates were employed for the purpose of recording the mother--infant interaction. For the purposes of training the coders, a videotape was made of a mother and her 10 month old son playing in her home. Coders were trained on various segments of this videotape for several weeks (10 sessions) before the actual study began. At the end of training, reliabilities for each variable averaged .85 or greater. Throughout the study, coders worked in pairs and a check was kept on their reliability, for as Reid (1970) has found, reliabilities tend to decrease if no monitoring of observers is performed during the course of the investigation. The observers, of course, were never told of the purpose or the hypotheses of the investigation until after the study was over.

After the data were collected they were condensed in the following manner: For each page of coded interaction, behavior categories were summed across the three minutes, creating one summation score for each behavior category. Thus, there were four sets of summation scores for each mother from each observation period for each observer. After the data from two coders were compared for computation of reliability scores, the three minute summary scores were averaged across two coders to arrive at the final data for the analyses of variance.

Reliability of observations was computed separately for each behavior category using a modified form of percentage agreement similar to that of Tulkin (1970) as follows: The three minute totals of each behavior category for two coders were compared across twenty-six mother--infant dyads for whom both coders had a complete record.[5] Twice the sum of the

[5] At bottom of page 10.

number of agreements per three minute period, divided by the total amount of interaction units checked for both coders provided the measure of percentage agreement. Reliabilities are reported in Table 1. The overall median percentage of agreement was 89.4%, with a range of 61.5% to 98.5%. The only variable with a percentage of agreement below 70% was "mother imitates infant."

Results of the observations were analyzed separately for each of the 27 mother--infant variables using a 2 x 2 x 2 x 2 (Class x Sex x Order x Observation) mixed model analysis of variance. The order of presentation of observation condition appeared to have no effect on the overall pattern of mother--infant interaction. In the interest of simplification of presentation, the variable of order was eliminated from further analyses. Thus the results which are reported are based on a 2 x 2 x 2 (Class x Sex x Observation) mixed model analysis of variance for each behavior category.

Results

Not all maternal and infant interaction behaviors appeared to be equally sensitive to the influence of the observer's presence. Of the 27 mother and infant behaviors studied, ten showed significant changes in frequency from unobtrusive to obtrusive observation (see table 2).

Turning first to the maternal behaviors, the overall effects of obtrusive observation were reflected in a general decrease in the amount of verbal interaction behaviors. Mothers talked to infants less, and issued fewer verbal directives and verbal prohibitions in the observer's presence. Mothers did, however, give objects to the infant more often in

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[5] Occasionally, due to illnes or transportation problems, only one coder was able to complete an entire 24 minute observation record. Since the coders had demonstrated adequate reliability, the data from these dyads were included in the analysis.

the obtrusive condition. In addition, while a mother occasionally may have ignored her infant when alone, she was less likely to ignore her baby in the observer's presence.

There were some changes, too, in frequency of some infant behaviors. While it was found that an infant was nearly always playing with some object regardless of condition, this was even more true when the observer was present. They also made more positive vocalizations, but they looked at mother less often when the observer was present.

Class Differences:

With regard to the main effects for social class, it was found that the only maternal behaviors that reflected class differences were those involving maternal verbalization Working class mothers asked more questions of their babies, provided more verbal directives and gave more verbal prohibitions of infant behavior than did ddle class mothers (see table 4). rthermore, when the individual variables of verbal interaction were combined (e.g., talks to infant, questions infant, mother laughs, vocalization prohibit, vocalization instructs, vocalization encourage or reward, and imitates infant), working class mothers again were found to engage in more verbal interactions than middle class mothers ($p < .001$). The only verbal behavior category that showed higher scores for middle class mothers was that of mother laughs.

One of the most important questions that could be asked of these data was whether the social class groups responded differently when observed unobtrusively or obtrusively. The results of the present investigation provide some evidence that they did (see Table 5).

Because of its reciprocal relation to other maternal behaviors, the dependent variable of mother merely observing (non-interaction) gained

special significance. If a mother scored high on this variable, she must necessarily have scored low on the other maternal interaction variables. With respect to the variable of mother merely observing, a significant class X observation interaction difference was found. Working class mothers were found to be merely observing their babies less often when observed unobtrusively than did middle class mothers ($p<.05$). When the observer was present these differences were not found. Furthermore, as can be seen in Table 5, several other social class differences in maternal behavior were found as a function of observation condition. When alone in the playroom, working class mothers held, talked to, questioned and provided verbal directives to their infants more often than did the middle class mothers. When observed, these social class differences were not significant. In summary, the effects of observation upon the two social class groups were reflected primarily on the verbal interaction variables, with the working class mothers producing significantly more verbalization in the unobtrusive condition--so much more, in fact that when the two observation conditions were combined, there was found an overall main effect for social class for these variables which favored the working class.

Sex Differences:

There were found to be no significant main effects for sex of infant either in infant or maternal behaviors. However, two trends were found concerning an interaction effect for observation X sex. While alone in the playroom mothers tended to spend more time holding or cuddling the female regardless of social class, while when the observer was present the opposite trend was found ($p<.09$). Furthermore, when observed unobtrusively, mothers more often provided verbal encouragement or rewards (e.g., "good baby") for the female infants, while when the observer was

present mothers gave the male infants more encouragement than the females ($p < .05$).

Discussion

Concerning the general question of what is the effect upon mother--infant interaction due to the process of observation, it appears that there is an inhibition of spontaneity on the part of the mothers. This may reflect some intimidation, such that a mother may not want to make a mistake in front of the "experts," and thus, may inhibit the quantity of her behaviors. This finding of inhibition of the subjects is in some ways similar to a study by Bechtel (1967) in which visitors to an art gallery were observed unobtrusively and obtrusively. When the visitors were aware of observation they tended to minimize their involvement with the artwork and would essentially leave the field.

The methodology of the present study did not appear to detect any sex differences in mother--infant interaction. The two interactions involving sex and observation for cuddling and praise behaviors may have been due to sex differences in infant temperament. The male babies tended to be less at ease (more negative vocalizations). The fact that the male babies received more praise and cuddling when the observer was present may have reflected the mother's attempt to keep him from crying or fussing in front of the observer.

The data for social class were somewhat surprising viewed in light of previous research (e.g., Tulkin and Kagan, 1972). For in the present investigation it was the working class mothers who provided a more enriched verbal environment (at least quantitatively) when observed unobtrusively. When the subjects were aware of observation, the two groups were more similar. It appeared that the working class mothers were more sensitive

and more inhibited in the presence of the observer. Thus, the reported superiority of the verbal environment of the middle class homes may be partially a function of the act of observation. Also, previously reported class differences in verbal interaction may have been due to what Tulkin and Kagan (1972) referred to as a sub-group of highly verbal middle class mothers.

Although the results of the present investigation are intriguing, it must be borne in mind that these results cannot be compared directly to the results of previous investigations. Several factors limit the generalizability of these results. One of these factors concerns the sample of subjects. For example, the relatively upwardly mobile working class subjects of the present study cannot be compared directly to the lower class samples of some previous research. Similarly, variations in the ecology of the situations must be taken into account. Observations made in the laboratory in which the mother has nothing to do should not be related directly to observations of a mother's daily routine in her home. Also, the short duration of the observations of the present study must be taken into account when comparing studies.

In summary, although developmental psychologists have long been aware of the potential biasing of observational data, there has been very little investigation of the social dynamics in the observational setting which may reduce the validity of observational data. In considering the limitations of the observational method due to the effects of the presence of the observer, Moss (1965) cautioned the investigator to attempt to make the mother feel comfortable in the situation and urged researchers to adopt a few precautions to reduce the possibility of significant effects of an observer from occurring. Moss felt that by de-emphasizing the mother as the focus of attention, providing sufficient warm-up periods and by making use of extensive observation periods, that more valid data would be obtained.

The results of the present investigation have underscored the need for these precautions. These precautions would be necessary especially if one were interested in the comparison of mother--child interaction across diverse samples of subjects: for it has been shown that in a laboratory investigation, the presence of an observer does have significant differential effects for the two social classes on some important aspects of mother--infant interaction.

Future research in this area should include study of the magnitude of observer effects in a variety of situations with various observers. Additional research is needed concerning unobtrusive observation and sex and social class differences.

Any future investigation of observer influence should also include an assessment of social desirability and perhaps other personality characteristics of the subjects. Although at this time it is known that the observer produced certain effects, it remains to be seen how serious a problem these effects pose for the field of observational child psychology. The results of this investigation should not be construed as an argument against the continued employment of the observational method. Rather, investigators should be advised to implement those sefeguards which will diminish the impact of obtrusive observation upon the research subjects.

Table 1

Reliabilities of Observations

infant behaviors	percent agreement	mother behaviors	percent agreement
moves toward mother	83.9	mother only observing	93.9
moves away from mother	89.0	mother restrains baby	89.7
plays with object	97.2	holds/cuddles infant	94.5
inspects object	98.5	talks to infant	90.6
looks at mother	99.3	questions infant	83.8
positive vocalization	92.8	mother laughs	91.1
negative vocalization	80.0	vocalization instructs	83.9
crying	95.2	vocal. encourage/reward	87.2
touches mother	83.4	vocalization prohibit	86.4
gives object to mother	77.4	entertains/demonstrates	93.1
imitates mother	80.0	gives object to infant	79.0
looks at observer	92.6	imitates infant	61.5
		looks at observer	74.5
		ignores infant	94.7

Table 2

Analysis of Variance Table for

Infant and Maternal Behaviors

SOURCE	SS	df	MS	F	P<
Moves Toward Mother					
Sex	0.23	1	0.23	0.084	n.s.
Class	11.44	1	11.44	4.193	.05
Observation	2.03	1	2.03	1.750	n.s.
S.X C.	0.34	1	0.34	0.124	n.s.
S.X Obs.	0.85	1	0.85	0.732	n.s.
C.X Obs.	0.34	1	0.34	0.245	n.s.
Error(Bet.)	98.20	36	2.73		
Error(W/in)	41.93	36	1.16		
Moves Away from Mother					
Sex	0.01	1	0.01	0.001	n.s.
Class	8.94	1	8.94	1.599	n.s.
Observation	1.44	1	1.44	1.028	n.s.
S.X C.	1.88	1	1.88	0.336	n.s.
S.X Obs.	0.06	1	0.06	0.042	n.s.
C.X Obs.	1.44	1	1.44	1.028	n.s.
Error(Bet.)	201.07	36	5.59		
Error(W/in)	50.42	36	1.40		
Plays with Object					
Sex	173.31	1	173.31	2.749	n.s.
Class	30.32	1	30.32	0.480	n.s.
Observation	86.63	1	86.63	7.858	.01
S.X C.	0.18	1	0.18	0.002	n.s.
S.X Obs.	9.28	1	9.28	0.842	n.s.
C.X Obs.	20.76	1	20.76	1.883	n.s.
Error(Bet.)	2269.97	36	63.05		
Error(W/in)	396.88	36	11.02		
Inspects Object					
Sex	61.25	1	61.25	1.806	n.s.
Class	7.20	1	7.20	0.212	n.s.
Observation	1.65	1	1.65	0.746	n.s.
S.X C.	2.81	1	2.81	0.082	n.s.
S.X Obs.	0.08	1	0.08	0.036	n.s.
C.X Obs.	5.78	1	5.78	2.613	n.s.
Error(Bet.)	1220.85	36	33.91		
Error(W/in)	79.60	36	2.21		

Table 2 (Continued)

ANOVA

SOURCE	SS	df	MS	F	P<
Looks at Mother					
Sex	0.75	1	0.75	0.080	ns.
Class	6.47	1	6.47	0.694	n.s.
Observation	17.34	1	17.34	3.796	.07
S.X C.	23.38	1	23.38	2.513	n.s.
S.X.Obs.	2.91	1	2.91	0.636	n.s.
C.X Obs.	0.23	1	0.23	0.050	n.s.
Error(Bet.)	334.93	36	9.31		
Error(W/in)	164.47	36	4.57		
Positive Vocalization					
Sex	10.33	1	10.33	0.457	n.s.
Class	6.19	1	6.19	0.273	n.s.
Observation	26.16	1	26.16	7.078	.025
S.X C.	2.72	1	2.72	0.120	n.s.
S.X Obs.	3.94	1	3.94	1.064	n.s.
C.X Obs.	20.25	1	20.25	5.478	.025
Error(Bet.)	813.73	36	22.60		
Error(W/in)	133.08	36	3.70		
Negative Vocalization					
Sex	1.19	1	1.19	2.356	ns.
Class	0.49	1	0.49	0.980	n.s.
Observation	0.01	1	0.01	0.020	n.s.
S.X C.	0.23	1	0.23	0.460	n.s.
S.X Obs.	0.13	1	0.13	0.265	n.s.
C.X Obs.	0.23	1	0.23	0.469	n.s.
Error(Bet.)	18.16	36	0.50		
Error(W/in)	17.61	36	0.49		
Crying					
Sex	0.01	1	0.01	0.040	n.s.
Class	0.13	1	0.13	0.520	n.s.
Observation	0.18	1	0.18	0.692	n.s.
S.X C.	0.28	1	0.28	1.120	n.s.
S.X Obs.	0.41	1	0.41	1.576	n.s.
C.X Obs.	0.04	1	0.04	0.153	n.s.
Error(Bet.)	8.65	36	0.25		
Error(W/in)	9.40	36	0.26		

Table 2 (Continued)

ANOVA

SOURCE	SS	df	MS	F	P<
Touches Mother					
Sex	3.10	1	3.10	0.688	n.s.
Class	11.06	1	11.06	2.460	n.s.
Observation	0.57	1	0.57	0.219	n.s.
S.X C.	0.18	1	0.18	0.040	n.s.
S.X Obs.	4.63	1	4.63	1.734	n.s.
C.X Obs.	0.02	1	0.02	0.007	n.s.
Error(Bet.)	161.89	36	4.50		
Error(W/in)	93.49	36	2.60		
Gives Object to Mother					
Sex	0.75	1	0.75	1.363	n.s.
Class	2.36	1	2.36	5.215	.05
Observation	0.66	1	0.66	2.102	n.s.
S.X C.	0.41	1	0.41	0.911	n.s.
S.X Obs.	0.72	1	0.72	2.322	n.s.
C.X Obs.	0.23	1	0.23	0.741	n.s.
Error(Bet.)	16.32	36	0.45		
Error(W/in)	11.25	36	0.31		
Imitates Mother					
Sex	0.80	1	0.80	1.355	n.s.
Class	0.45	1	0.45	0.762	n.s.
Observation	0.20	1	0.20	0.512	n.s.
S.X C.	0.53	1	0.53	0.898	n.s.
S.X Obs.	0.08	1	0.08	0.205	n.s.
C.X Obs.	0.15	1	0.15	0.384	n.s.
Error(Bet.)	21.15	36	0.59		
Error(W/in)	14.08	36	0.39		
Looks at Observer					
Sex	1.65	1	1.65	0.190	n.s.
Class	0.15	1	0.15	0.017	n.s.
Observation	809.63	1	809.63	93.366	.001
S.X C.	65.70	1	65.70	7.577	.01
S.X Obs.	1.65	1	1.65	0.190	n.s.
C.X Obs.	0.15	1	0.15	0.017	n.s.
Error(Bet.)	312.18	36	8.67		
Error(W/in)	312.18	36	8.67		

Table 2 (Continued)

ANOVA

SOURCE	SS	df	MS	F	P<
Mother Only Observing					
Sex	0.01	1	0.01	0.001	n.s.
Class	84.05	1	85.05	0.851	n.s.
Observation	6.61	1	6.61	0.154	n.s.
S.X C.	9.45	1	9.45	0.094	n.s.
S.X Obs.	52.00	1	52.00	1.212	n.s.
C.X Obs.	122.51	1	122.51	2.857	.10
Error(Bet.)	3594.38	36	99.84		
Error(W/in)	1543.86	36	42.88		
Mother Restrains Baby					
Sex	1.13	1	1.13	1.527	n.s.
Class	0.03	1	0.03	0.040	ns.
Observation	0.20	1	0.20	0.487	n.s.
S.X C.	1.95	1	1.95	2.628	n.s.
S.X Obs.	0.05	1	0.05	0.121	n.s.
C.X.Obs.	0.00	1	00.00	0.000	n.s.
Error(Bet.)	26.75	36	0.74		
Error(W/in)	14.76	36	0.41		
Holds/Cuddles Infant					
Sex	0.11	1	0.11	0.002	n.s.
Class	48.05	1	48.05	1.278	n.s.
Observation	10.15	1	10.15	0.519	n.s.
S.X C.	10.15	1	10.15	0.270	n.s.
S.X Obs.	61.25	1	61.25	3.136	.09
C.X Obs.	7.81	1	7.81	0.399	n.s.
Error(Bet.)	1352.42	36	37.57		
Error(W/in)	703.22	36	19.53		
Talks to Infant					
Sex	1.38	1	1.38	0.021	n.s.
Class	96.80	1	96.80	1.476	n.s.
Observation	79.00	1	79.00	3.775	.07
S.X C.	23.65	1	23.65	0.360	n.s.
S.X Obs.	19.01	1	19.01	0.908	n.s.
C.X Obs.	28.20	1	28.20	1.347	n.s.
Error(Bet.)	2359.36	36	65.54		
Error(W/in)	753.34	36	20.92		

Table 2 (Continued)

ANOVA

SOURCE	SS	df	MS	F	P<
Questions Infant					
Sex	3.30	1	3.30	0.359	n.s.
Class	31.56	1	31.56	3.435	.08
Observation	0.01	1	0.01	0.002	n.s.
S.X C.	2.19	1	2.19	0.238	n.s.
S.X Obs.	0.23	1	0.23	0.068	n.s.
C.X Obs.	4.88	1	4.88	1.452	n.s.
Error(Bet.)	330. 81	36	9.19		
Error(W/in)	120.88	36	3.36		
Mother Laughs					
Sex	0.02	1	0.02	0.009	n.s.
Class	1.73	1	1.73	3.570	.08
Observation	0.23	1	0.23	0.547	n.s.
S.X C.	2.03	1	2.03	4.204	.05
S.X Obs.	0.34	1	0.34	0.850	n.s.
C.X Obs.	0.04	1	0.04	0.095	n.s.
Error(Bet.)	17.40	36	0.48		
Error(W/in)	15.23	36	0.42		
Vocalization--Instructs					
Sex	1.19	1	1.19	0.157	n.s.
Class	34.13	1	34.13	4.509	.05
Observation	16.43	1	16.43	6.163	.025
S.X C.	0.18	1	0.18	0.067	n.s.
S.X Obs.	3.10	1	3.10	1.161	n.s.
C.X Obs.	6.76	1	6.76	2.531	n.s.
Error(Bet.)	272.47	36	7.57		
Error(W/in)	95.95	36	2.67		
Vocalization--Encourage/Reward					
Sex	0.06	1	0.06	0.171	n.s.
Class	0.34	1	0.34	0.971	n.s.
Observation	0.18	1	0.18	2.849	.10
S.X C.	0.18	1	0.18	0.519	n.s.
S.X Obs.	0.34	1	0.34	5.583	.025
C.X Obs.	0.01	1	0.01	0.168	n.s.
Error(Bet.)	12.60	36	0.35		
Error(W/in)	2.22	36	0.06		

Table 2 (Continued)

ANOVA

SOURCE	SS	df	MS	F	P<
Vocalization--Prohibit					
Sex	1.01	1	1.01	0.577	n.s.
Class	7.81	1	7.81	4.474	.05
Observation	2.45	1	2.45	4.470	.05
S.X C.	1.13	1	1.13	0.645	n.s.
S.X Obs.	0.15	1	0.15	0.272	n.s.
C.X Obs.	0.15	1	0.15	0.272	n.s.
Error(Bet.)	62.86	36	1.75		
Error(W/in)	19.73	36	0.55		
Entertains--Demonstrates					
Sex	4.51	1	4.51	0.035	n.s.
Class	49.61	1	49.61	0.392	n.s.
Observation	12.01	1	12.01	0.473	n.s.
S.X C.	5.00	1	5.00	0.039	n.s.
S.X Obs.	18.05	1	18.05	0.711	n.s.
C.X Obs.	6.61	1	6.61	0.260	n.s.
Error(Bet.)	4549.11	36	126.36		
Error(W/in)	913.06	36	25.36		
Gives Object to Infant					
Sex	0.61	1	0.61	0.177	n.s.
Class	0.45	1	0.45	0.130	n.s.
Observation	6.90	1	6.90	4.664	.05
S.X C.	1.13	1	1.13	0.328	n.s.
S.X Obs.	1.01	1	1.01	0.628	n.s.
C.X Obs.	2.11	1	2.11	1.427	ns.s
Error(Bet.)	123.87	36	3.44		
Error(W/in)	53.28	36	1.48		
Imitates Infant					
Sex.	0.20	1	0.20	0.645	n.s.
Class	0.15	1	0.15	0.483	n.s.
Observation	0.01	1	0.01	0.001	n.s.
S.X C.	0.20	1	0.20	0.645	n.s.
S.X Obs.	0.15	1	0.15	0.022	n.s.
C.X Obs.	0.05	1	0.05	0.007	n.s.
Error(Bet.)	11.06	36	0.31		
Error(W/in)	6.59	36	6.59		

Table 2 (Continued)

ANOVA

SOURCE	SS	df	MS	F	P<
Looks at Observer					
Sex	0.28	1	0.28	0.875	n.s.
Class	0.34	1	0.34	1.062	n.s.
Observation	7.05	1	7.05	22.298	.001
S.X C.	0.09	1	0.09	0.281	n.s.
S.X Obs.	0.28	1	0.28	0.875	n.s.
C.X Obs.	0.34	1	0.34	1.062	n.s.
Error(Bet.)	11.38	36	0.32		
Error(W/in)	11.38	36	0.32		
Ignores Infant					
Sex	0.53	1	0.53	0.079	n.s.
Class	0.20	1	0.20	0.030	n.s.
Observation	14.03	1	14.03	3.961	.06
S.X C.	14.45	1	14.45	2.174	n.s.
S.X Obs.	0.08	1	0.08	0.022	n.s.
C.X Obs.	0.31	1	0.31	0.087	n.s.
Error(Bet.)	239.29	36	6.65		
Error(W/in)	127.51	36	3.54		

Table 3

Significant Mean Differences Under Conditions of Observer Absent Versus Present: Number of Ten-Second Intervals Checked Per Three-Minute Observation Period

BEHAVIOR	UNOBSERVED	OBSERVED	P<
Infant Plays with Object	14.419	15.459	.01
Infant Looks at Mother	2.328	1.772	.06
Infant's Positive Vocalization	3.028	3.600	.025
Infant Looks at Observer	0.000	3.181	.01
Mother Talks to Infant	5.184	4.191	.06
Maternal Vocalization Instructs	1.059	0.606	.025
Maternal Vocalization Prohibits	0.403	0.228	.05
Mother Gives Object to Infant	0.819	1.112	.05
Mother Looks at Observer	0.000	0.062	.01
Mother Ignores Infant	0.481	0.062	.06

Table 4

Significant Mean Differences for Social Class: Number of Ten-Second Intervals Checked Per Three-Minute Observation Period

BEHAVIOR	MIDDLE CLASS	WORKING CLASS	P<
Infant Moves Toward Mother	0.881	0.503	.05
Infant Gives Object to Mother	0.209	0.038	.05
Mother Questions Infant	0.675	1.303	.07
Mother Laughs	0.288	0.141	.08
Maternal Vocalization Instructs	0.506	1.159	.05
Maternal Vocalization Prohibits	0.159	0.472	.05

Table 5

Table of Means

Class Differences for Each Observation Period

Behavior Catagory	UNOBSERVED					OBSERVED				
	Soc. Class		stan. dev.			Soc. Class		stan. dev.		
	mid.	work.	mid.	work.	p<	mid.	work.	mid.	work.	p<
moves toward mother	0.769	0.456	0.92	0.61	.06	0.994	0.550	0.68	0.61	.025
moves away from mother	0.788	0.588	1.02	0.66	n.s.	1.056	0.588	1.17	0.70	.05
plays with object	14.981	13.856	2.86	3.44	n.s.	15.512	15.406	3.09	3.25	n.s.
inspects object	17.050	16.481	1.29	2.73	n.s.	16.925	16.894	1.83	2.58	n.s.
looks at mother	2.406	2.069	1.34	1.26	n.s.	1.888	1.656	1.29	1.35	n.s.
positive vocalization	3.419	2.638	2.01	1.18	.07	3.488	3.712	2.33	2.28	n.s.
negative vocalization	0.081	0.106	0.03	0.57	n.s.	0.025	0.156	0.34	0.16	n.s.
crying	0.062	0.000	0.28	0.00	n.s.	0.088	0.069	0.27	0.31	n.s.
touches mother	0.162	0.550	0.32	1.49	.08	0.262	0.619	0.54	0.94	.10
gives object to mother	0.138	0.019	0.36	0.06	n.s.	0.281	0.056	0.48	0.13	.01
imitates mother	0.044	0.162	0.09	0.27	n.s.	0.138	0.169	0.29	0.56	n.s.
looks at observer	0.000	0.000	0.00	0.00	n.s.	3.138	3.225	1.76	2.63	n.s.
mother only observing	6.725	4.462	3.42	4.57	.05	5.775	5.988	3.32	5.02	n.s.
mother restrains baby	0.206	0.188	0.41	0.30	n.s.	0.156	0.138	0.30	0.49	n.s.
holds/cuddles infant	0.744	1.831	1.17	4.04	.09	0.700	1.162	1.03	3.10	n.s.
talks to infant	4.338	6.031	2/40	3.85	.05	3.938	4.444	2.77	3.65	n.s.
questions infant	0.556	1.431	0.70	1.25	.01	0.794	1.175	0.91	1.77	n.s.
mother laughs	0.325	0.156	0.44	0.27	.05	0.250	0.125	0.31	0.31	n.s.
vocalization instructs	0.588	1.531	0.91	1.35	.01	0.425	0.788	0.58	1.41	n.s.
vocal. encourage/reward	0.088	0.156	0.15	0.31	n.s.	0.044	0.106	0.14	0.26	n.s.
vocalization prohibit	0.269	0.538	0.43	0.70	.05	0.050	0.406	0.12	0.65	.01
punishes infant	0.000	0.000	0.00	0.00	n.s.	0.000	0.000	0.00	0.00	n.s.
entertains/demonstrates	7.294	8.369	3.43	5.16	n.s.	7.969	8.469	3.44	4.70	n.s.
gives object to infant	0.700	0.938	0.67	0.67	n.s.	1.156	1.069	0.93	0.73	n.s.
imitates infant	0.081	0.150	0.16	0.25	n.s.	0.094	0.112	0.19	0.34	n.s.
looks at observer	0.000	0.000	0.00	0.00	n.s.	0.362	0.231	0.47	0.30	n.s.
ignores infant	0.475	0.488	1.66	1.46	n.s.	0.119	0.006	0.48	0.03	n.s.

Table 6

Table of Father's Occupations

Middle Class	Working Class
engineer (3)	factory assembler (3)
professor (2)	store clerk (3)
policeman (2)	truck driver (3)
admissions counselor	landscaper (2)
attorney	pipe fitter (2)
C. P. A.	butcher
computer programmer	carpenter
dentist	heating installer
district attorney	lumberman
graduate student	mechanic
inspector	roofer
insurance broker	steel worker
music teacher	
narcotics officer	
speech therapist	
teacher (high school)	

Figure 1

Subject _____ Rater _____

Date _____ Time _____

	10	20	30	40	50	60	10	20	30	40	50	60	10	20	30	40	50	60
moves toward mother																		
moves away from mother																		
plays with object																		
inspects object																		
looks at mother																		
positive vocalization																		
negative vocalization																		
crying																		
touches mother																		
gives object to mother																		
imitates mother																		
J ts at observer																		
mother only observing																		
mother restrains baby																		
holds/cuddles infant																		
talks to infant																		
questions infant																		
mother laughs																		
vocalization instructs																		
vocal. encourage/reward																		
vocalization prohibit																		
punishes infant																		
entertains/demonstrates																		
g s object to infant																		
imitates infant																		
l : observer																		

Figure 2

Coding Category Explanation

INFANT BEHAVIORS:

1) Moves toward mother:	infant advances toward mother, no distinction is made of the infant's intentions, i.e. for attention or to seek a toy that mother may be holding.
2) Moves away from mother:	infant makes a move away from the immediate vicinity of the mother for any reason.
3) Plays with object:	infant holds, handles, manipulates, or sucks on an object (he does not need to be looking at it).
4) Inspects object:	infant fixates on an object and appears absorbed in examining it (he does not need to be holding it).
5) Looks at mother:	infant looks directly at mother (usually her face) for any reason.
6) Positive vocalization:	any vocalization of the infant other than distress, eg. talking, babbling, cooing, grunting, etc.
7) Negative vocalization:	infant vocalizations that seem to express dissatisfaction or annoyance, eg. frets, whines, etc.
8) Crying:	infant cries (as distinct from negative vocalization).
9) Touches mother:	infant reaches to touch mother, or crawls onto her lap.
10) Gives object to mother:	infant presents object to mother by handing it to her, dumping it in her lap or deliberately placing it in front of her.
11) Imitates mother:	infant copies any sound, action or facial expression initiated by mother.
12) Looks at observer:	infant looks directly at observer (usually the face).

Figure 3

MOTHER BEHAVIORS:

1) Mother only observing:	mother watches infant silently and without interacting.
2) Mother restrains baby:	mother physcially prevents infant from carrying out some action.
3) Holds/cuddles infant:	mother picks up or hugs infant, places infant on her lap or kisses baby.
4) Talks to infant:	this category is used to include all non-specific verbalizations of the mother, eg. naming.
5) Questions infant:	mother asks baby any question.
6) Mother laughs:	mother laughs, snickers.
7) Vocalization, instruct:	mother gives verbal directives to infant to do or say something.
8) Vocalization, encourage/ reward:	mother praises or gives verbal reassurance or affirmation to the infant eg. "good baby".
9) Vocalization, prohibit:	mother verbally warns baby or commands him not to do some action.
10) Punishes infant:	mother verbally or physically reprimands infant following some action.
11) Entertains/demonstrates:	mother attempts to amuse infant with some action or by singing, etc., or mother demonstrates how a toy is used.
12) Gives object to infant:	mother hands an object to baby, places it in front of him or in his lap.
13) Imitates infant:	mother copies a sound or action which was first exhibited by infant.
14) Looks at observer:	mother looks directly at observer or talks to him.
15) Ignores infant:	mother neither interacts with nor watches infant, eg. mother reading magazine.

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